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XXVII.—*Notes on the Habits of certain Exotic Spiders.* By
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“Ut araneoli, tenuem formavimus orsum.”—Virgil, *Culex*, v. 2.

SPIDERS are among the most artful of created creatures; their whole life consists of one continued course of craft and stratagem, whether they sneak about on the surface of leaves, as green as their own emerald bodies, and surprise the poor flies that venture to approach within the range of their fatal spring; whether they gloomily lurk in holes, “specus ipsa qua concameratur architectura!”—or under the shade of dingy tents, “contra frigora quanto villosior!”—and spring upon insects that chance to pass their door, “cum vero captura incidit, quam vigilans et paratus ad cursum!”—whether they lie supine in the broad daylight, motionless in their wide-spread treacherous toils, and, having seen their victim fairly entangled, wrap him up in a winding-sheet of their own manufacture; or whether, simulating the surface of the ground on which they live, they course their prey with untiring assiduity, and, having run it down, suck its blood with tiger-like ferocity. Spiders are the originators of spinning and weaving, and have been pressed into the service of the manufacturers of silk and satin, together with those

“Spinning worms

That in their green shops weave the smooth-hair’d silk,”

and, more particularly on account of their habits, deserve to excite more interest than they meet with. Unheeded, or regarded with repulsive loathing by the “cui bono?” people of the present generation, spiders have adorned the page of the poet and philosopher in more ancient times. Has not Ovid sung the misfortunes of that Lydian maiden, daughter of Idmon, who, proud of her talent in the art of weaving, dared to challenge even Minerva

herself, and who for her presumption was changed by the jealous goddess into a spider—ARACHNE?

“Fitque caput minimum; toto quoque corpore parva est;
In latere exiles digiti pro cruribus hærent;
Cetera venter habet; de quo tamen illa remittit
Stamen, et antiquas exercet aranea telas*.”

Virgil, in enumerating the depredators of the bee-hives, such as lizards, cockroaches, hornets and moths, has mentioned the curious fact that

“..... invisa Minervæ
Laxos in foribus suspendit aranea casses†.”

Another poet no less distinguished, Lucretius, in alluding to the minute objects which our senses fail to detect on ordinary occasions, enumerates among other things the slight ærial films of the gossamer spider:—

“..... neque aranei tenuia fila
Obvia sentimus, quando obretimur euntes‡.”

Julius Obsequens, in his work on Portents and Prodigies, observes that the standards of the legion, which had been left by Pansa for the protection of Rome, seemed to have been bound round or “netted over” with spiders’ webs, which, in that age of superstitious credulity, was regarded as an evil omen. In the days of Pliny the motions of spiders were watched as being sure prognostics of the state of the weather, as they are indeed in our own day,—

“Multa aranea imbrium signa sunt.”

Pliny speaks admiringly of the astute cunning of the spider when he observes his craft in keeping a little aloof from the centre of his toil, “quam remotus a medio aliudque agentis similis!” and concealed in such a manner “ut sit necne intus aliquis, cerni non possit!” The Roman naturalist doubtless here alludes to those sedentary Arachnidans to which Walckenaer has given the name of “Tapitèles.” Pliny considers these insects well-worthy to be studied: “Araneorum natura, digna vel præcipue admiratione.”

In the woods of Singapore I made a capture of a very large and handsome species of *Nephila* which I do not find described. The thorax is covered with a rich golden pubescence; the terminal half of the palpi is deep black, the penultimate half red above and yellow beneath; the chelicera are large and shining black; the abdomen has a black band at the anterior part, and posteriorly, and on the sides, large bright patches of yellow; the cephalothorax, where not hid by the silky hairs, is dark green

* Ovid, *Metamorph.* lib. vi. v. 142.

† Georg. lib. iv. v. 246.

‡ Lib. iii. v. 384.

with yellow striæ; the legs are black, with bright yellow rings at the joints, and the thighs, on the under surface, are bright yellow; the eyes are black and shining. This species, which, from its beauty, might be named *Nephila ornata*, constructs a very large, strong, geometrical web, stretched vertically between low bushes.

At the island of Ternati I made a capture of a large and splendid undescribed species of *Nephila*, which spins a very large strong web among the bamboos. The body is liver-coloured, with a silver horse-shoe mark; the thorax is covered with a downy, hoary, pubescence; the shanks of the tibiæ of the two first pairs of legs have a broad yellowish white band; the other legs are black.

In the island of Panagatan I made a capture of another species of *Nephila*, which I also consider as undescribed. The head is blackish; thorax silvery with black spots, and covered with a downy pubescence; legs chestnut-red, with the last joints black. The body is of a light emerald green with numerous bright yellow spots; the under surface is dull black. It forms a large, strong, geometrical web, spreading from bush to bush, in the centre of which it remains motionless with legs stretched out and the head downwards.

Among the Bashees or Batani group of islands, spiders of the genera *Nephila* and *Acrosoma* are numerous. There is one very large and showy species of the latter genus, which has a very strange habit when alarmed of suddenly erecting the second pair of legs with a rapid jerking motion, while, at the same time, he gathers together all the other members, and shakes his web violently, in order, apparently, to intimidate his adversary, or perhaps to ascertain the strength of his position. If, however, the cause of alarm be continued, he coils himself up, while all his extremities become rigid, as in death, and then, falling to the ground, he remains like a small inanimate brown ball until the enemy has departed. His cunning never forsakes him even in his greatest emergency, for he continues all this while actually to maintain a communication between himself and his web by means of a fine thread, fixed at one end to the centre of his cunningly wrought toil, and at the other attached to the spinneret at the extremity of his abdomen. By means of this attenuated and invisible cord he will climb up again when the danger is over, and resume his old-established pastime of rapine and bloodsucking. Like some unfledged animals with no more than two legs, these spiders are the veriest cowards when menaced by those stronger than themselves, and the most unsparing tyrants when those of a weaker nature are within their power.

Among the islands of the Maiacoshima group I observed a spider, belonging to the genus *Attus*, among the thousands of dead

Truncatellæ that fill the holes and corners of the rocks in every part of these islands, which forms a convenient abode in these small shells, lining them carefully with a fine silken tapetum. Near the sea-coast a minute species of *Pagurus* was found occupying these little truncated univalve shells, crawling about by thousands. Our spider, however, is unable to move about with its borrowed house in the manner of those pirate crabs, but either sits sedentary in his den, or ventures forth at intervals on his predatory hunting excursions.

Among the rocks of a small islet near Quelpaart, the largest of the Korean islands, there is a species of spider which forms a very ingenious dwelling which may be compared to that of the swallow, whose nest affords such an important article in the gastronomy of wealthy Mandarines, the *Hirundo esculenta*, but adhering to the rough surface of the rock in a reversed position, resembling a watch-pocket upside down. It is composed of a substantially woven silky material, and firmly secured by means of a glutinous secretion. The ingenious little builder and proprietor of this strange castle in the air lets himself down by a rope-ladder, or to speak less fancifully, by a fine spun web, which he manufactures for the purpose out of the substance of his body as required, he himself serving the purpose of a weight, “*deducit stamina, ipso se pondere usus*,” as Pliny observes in his chapter ‘*De Araneis*.’

The spiders of the Maiacoshima islands exhibit some very remarkable forms. There is a curious *Epeira* with the dorsal surface of the abdomen furnished with a radiated crown of hard pointed processes, and the epidermis richly painted with brown and gold. It spins a large and regular web in every brake and bush. Another large and singular spider, with long slender legs and an elongated body, black, and marked with yellow lunules and patches, crawls among the foliage of the trees in the low woods that occur in some parts of Pa-tchung-San. Another species of the same genus is altogether black. I noticed this kind also in the Bashee group.

The *Thelyphonus caudatus*, or a closely-allied species, a curious osculating link between the Scorpions and Tarantulas, is not uncommon in the islands of the Maiacoshimas. It remains generally concealed under logs of wood and under stones, and seems to love dark damp forests as the seat of its depredations, living in the society of the larvæ of glow-worms, the scorpions, the *Scolopendræ*, and a dingy-coloured species of *Blatta*. It is slow in its movements, and when alarmed raises its stingless tail in a threatening manner, but never attempts to use its chelicerae either as organs of aggression or of defence.

Never have I been better amused than when observing in the

forests of Mindanao the habits of the extraordinary spiders that abound there, to figure and describe the varied forms of which would require the pencil of Abbot, and many years of unwearied application.

The bodies of the *Epeiræ* seen in the tropics are often most splendidly ornamented, I might almost say illuminated, for many of them remind you of the gaudy ancient missals painted by monks in the dark ages. You may have white figures on a red ground; red, yellow and black, in alternate streaks; orange marbled with brown; light green with white ocelli; yellow with light brown festoons, or ash-coloured and chestnut bodies with crescents, horse-shoes, Chinese characters, and grotesque hieroglyphics of every description. Then again the shape of their bodies is endless in variety; they are round or oval, flattened or globular, angular, tuberculated, lobed, spined, or furnished with hairy tufts. These examples,

“Whose shapes would make them, had they bulk and size,
More hideous foes than fancy can devise,”

taken at random during one or two excursions in the woods, will tend to show what a wide field is open to the naturalist in these regions of the sun, provided he has nothing of more importance to engage his attention than the investigation of apterous insects.

In the forests about Calderos in Mindanao, I collected some splendid species of gold- and silver-marked *Tetragnatha*. One, which might be named *T. nitens*, has a dark, shining brown thorax, and a glittering silver body with five black spots; the legs banded with dark brown, and the under side light black. It constructs a large, ingenious, symmetrical web, and drops, when touched, to the ground, taking care, however, at the same time, to suspend itself by a web, by means of which it ascends again when the enemy has departed. In the centre of its web it spins concentric circles and thick mazes of a fine yellow colour, and often of very complicated devices. When it falls to the ground it folds up its legs and feigns death, all its members being perfectly rigid.

The *Tetragnatha* all have a remarkable habit of dividing their eight legs, as they cling, head downwards, to the centre of their toils, throwing out four directly forwards and four directly backwards. Some species however have the third pair of legs extended straight out in a lateral direction. Another common species had a body mottled with dark brown and covered with white markings; legs brown, banded; the thorax burnished bright green with darker markings. I have named it provisionally *T. refulgens*. Numbers of the genus *Theridion*, of a black colour, were running

actively about among the dry dead leaves that strewed the ground, and some handsomely-coloured species were discovered crouching among the foliage of the trees. One was marked like the *T. Sisyphus* of Hahn (tab. 58. fig. 132), and another large-sized species was of a bright emerald green. The *Attus formicoides*, Walckenaer, or an allied species, was basking on the dead leaves in the sunny spots; and numerous pretty species of *Salticus*, allied to *S. crux* (Hahn, tab. 17. fig. 52), but of much larger dimensions, were common spiders. A species of *Attus*, allied to *formicoides*, which may be called *splendens*, was taken here: it was of a brilliant metallic green gold with the under surface fine metallic purple; the legs banded with light brown and burnished green. It was springing about the foliage of the low trees.

Another *Attus* was of a shining black, with several bright ultramarine spots on the abdomen, and light brown legs banded with darker brown. Numbers of black-coloured *Theridia* were running about over the dead leaves, simulating, at a little distance, so many odd-shaped ants: numerous other species of this genus, which were seen living among the flowers and foliage of the trees, had their abdomens variegated with beautiful colours. One species, with a hairy body and legs, and shining chestnut-coloured chelicera, runs quickly when pursued, and uses those organs in self-defence. Its body is of a dark olive-brown, and it appears to love dark nooks and holes of the bark of trees, and frequently hangs suspended from the under surface of the leaves.

I observed another species, which knew it was watched, place itself upon a diseased leaf, where it remained quite stationary until after I had taken my departure; and had I not seen the sidelong movement of the cunning little creature in the first instance, I should not have been able to distinguish its body from the eroded surface of the partially decayed leaf. Those that live among the foliage and flowers are vividly coloured, and many flies and other insects are no doubt attracted towards the treacherous forms of these spiders by reason of their bright and gaudily-tinted bodies. I have seen the abdomen of one marked with black, yellow and crimson, three powerfully-contrasted colours. Others are green and actually reticulated like the veined surface of a leaf, with the midrib running down the centre and the secondary nervures proceeding outwards from each side; the bodies of others resemble the splendid variegated blossoms of the different sorts of *Calceolarias* grown in our gardens.

Several timid, soft, retiring, long-legged *Pholci*, with fawn-coloured bodies and semitransparent red-brown legs covered with long hairs, formed in many parts large loose webs among the rotten wood and leaves that strewed the ground. The legs of these Arachnidans appear too weak to support their bodies in

running, therefore they resemble their aquatic marine analogues the *Pycnogonidae*, which remain stationary among the tangled and thread-like Keratophytes, which constitute the webs of those spider-like Crustaceans, and thus watch cautiously for prey, and, when it is caught in their toils, consume it at their leisure, so making up by cunning and persevering watching for the want of that strength and force possessed by some of their consimilars. Most of the Arachnidans would appear on a careful comparison to have very distinct analogies with the families of Crustaceans*.

The nimble-limbed *Dolomedes*, that run after their prey and catch them by swiftness of foot rather than by stratagem, have slender legs, and living on the ground, are generally of dingy colours; with the exception, however, of those very large and powerful species, which, if not rendered somewhat conspicuous to the sight of other insects, might do too much damage to the tribes they are destined to keep in check. Most of these, therefore, have the thorax and abdomen margined with a light colour that contrasts strongly with that of their bodies. The *Saltici* generally resemble more or less the colour of the places they inhabit. I noticed a species, among the dense thickets, formed by *Abrus precatorius* and other trees, with a black abdomen, marked on each side with dull scarlet,—curious as being the colours of the seeds of *Abrus*, which are called by children “blackamoor beauties;” those species that live on the barks of trees are mottled gray and brown, and those which you find upon the ground are altogether black and dingy-coloured. How admirably, in these examples, is shown the fitness of things, maintained even between organisms usually deemed so abject, and the domains they owe to ever-careful Nature! It matters not much whether we say the place determines the nature of the animal, or whether the animal is adapted to the place, although it is more pleasing to an observer of nature to trace the harmonies and adaptations to an intelligent foresight, like the good St. Pierre, than to make them merely the necessary results of a physical arrangement of the earth’s surface, like the ingenious author of the ‘Vestiges of the Natural History of Creation.’

In a beautiful wood behind Calderos in Mindanao, I observed a dingy little species of spider of the genus *Clubiona*, concealing itself in very snug retreats, formed out of a dead leaf rolled round

* The Baron Walckenaer has even compared one family of *Philodromi* to “Crabes longipèdes,” and has named a subdivision of *Thomisus* “Crustacéides,” because their bodies are covered with rugosities like those of some Crustaceans. To men fond of “quinary” theories the Arachnidans would offer a rich treat, and innumerable analogies might be traced with much amusement, if not with much instruction.

in the shape of a cylinder, lined with a soft silken tissue, and closed at one end by means of a strong-woven felt door. When hunted it was amusing to see the frightened little creatures run for protection into their tiny castles, where they would doubtless be saved from the attacks of birds owing to the leaves not being distinguishable from others that strew the ground.

During an excursion I made into the interior of the island of Basilan, I observed the ground in one part of the forest near Passan literally overrun with a small, black, agile species of *Lycosa*, many of which had a white, flattened, globose cocoon affixed to the ends of their abdomens. It was most amusing to watch the earnest solicitude with which these jealous mothers protected the cradles of their little ones, allowing themselves to fall into the hands of the enemy rather than be robbed of the silken nests that contained their helpless progeny. All spiders are gifted with the same "storge," or maternal instinct, and resort to various methods for the purpose of securing their cocoons. The *Theridion*, when a seizure of the precious burden is threatened, tumbles together with it to the ground and remains motionless, guarding it with solicitous anxiety; and the *Thomisus* covers the receptacle of its offspring with its body, and when robbed of it wanders about disconsolate. Did the minute size of these poor spiders admit of the same psychological dissertations, anecdotes as interesting, no doubt, as those told of the she-bear when robbed of her cubs, or the violent emotions of the lioness when disturbed in her maternal duties by the hunters in the jungle, might be recorded, proving how strong is the love of offspring even in animals the most insignificant.

In Borneo, as among the islands of the Philippine Archipelago, spiders are also very numerous. In consideration of their apparently helpless condition and the soft nature of their integuments, nature, always inclined to protect the weak and helpless, has given the spiders a multitude of wonderful instincts, by means of which they are enabled to defend themselves from injury, provide themselves with food, and furnish safe retreats for their tender progeny. They spin their toils of cunning device, and even powerful insects, armed with formidable stings, are made captives with impunity, despite their struggles to escape the captor. These spiders' webs generally attract the attention of travellers, and certainly, in some parts of the forests of Mindanao, Borneo and Celebes, there is great and wonderful diversity in the form and construction of these ingenious and delicately-woven nets. Many have black webs, some have white, others brown, and in Mindanao I have observed toils formed of perfectly yellow threads. The nets of the great species of *Nephila* which

abound in equatorial regions frequently stretch across the path from bush to bush, and prove very troublesome to the naturalist while threading the thickets where they are numerous.

The imagination can scarcely conceive the bizarre and fantastic shapes with which it has pleased nature to invest those hard-bodied spiders called by naturalists *Acrosoma*. They have large angular spines sticking out of their bodies, in every kind of fashion, perhaps intended as some sort of defence against the soft-billed birds, which doubtless would otherwise make dainty meals of these Arachnidans, exposed as they are, temptingly suspended in mid-air, on their transparent webs in the forest glades. Some are protected by these long spines to such a degree that their bodies resemble a miniature "chevaux de frise," and could not by any possibility be swallowed by a bird without producing a very unpleasant sensation in his throat. One very remarkable species (*Gasteracantha arcuata*, Koch) has two enormous, recurved, conical spines, proceeding upwards from the posterior part of the body, several times longer than the entire spider.

The *Drassi* are gloomy spiders, haunting obscure places, and their garb is dark-coloured and dingy, in accordance with their habits: they are mostly pale brown, black, dull red or gray.

The *Thomisi* are varied in their colour, in harmony with their usual abiding-places: thus those that spend their lives among the flowers and foliage of the trees are delicately and beautifully marked with green and orange, black and yellow. One species, which I have named *T. virescens*, simulates the vegetation among which it lives, is not agile in its movements, but drops, when alarmed, among the foliage. It is of a pale, delicate, semitransparent sap-green, with the eyes and chelicera red. There is a large mark on the surface of the abdomen, beautifully variegated with yellow, pink, and black, and margined with dead-white spots. The under surface is green in the middle and dead-white on either side, and the spinneret is pink.

I remember one day while living at Sarāwak in Borneo, I was much amused with a struggle between a house-lizard (*Ptyodactylus Gecko*), a little domestic reptile which frequents the dwellings of the Malays, and a large species of *Lycosa*; the "Chichak," as the natives term their familiar Gecko, proved victorious, and succeeded in swallowing the spider, whose enormous legs, protruding from the lizard's mouth, gave this strange compound animal the aspect of some wondrous Octopod. Pliny records the fact however that spiders are in the habit of capturing small lizards, first entangling them in their webs and afterwards destroying them with their jaws,—a spectacle, he observes, worthy of the amphitheatre!